A1 Cont

applying an electrostatic potential between the first blade and the second blade to generate a torque to move the first blade relative to the second blade along a rotational range of motion; and

maintaining the distance of the gap between the first and second blades through the rotational range of motion.

18. (Amended) The method of claim 17, further comprising adjusting the torque along the range of motion.

19. (Amended) The method of claim 18, wherein the adjustment of the torque is maintained approximately constant along the range of motion.

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27. (Amended) The apparatus of claim 26, wherein the first blade is configured to move relative to the second blade along a range and wherein the distance between the first blade and the second blade is maintained substantially constant throughout the range of motion.

28. (Amended) The apparatus of claim 23, wherein the movable frame is pivotally coupled using the first plurality of torsion beams.

A3

32. (Amended) The apparatus of claim 23, wherein the first flexure comprises a pair of torsion beams.

A4

34. (Amended) The apparatus claim 23, wherein the second flexure comprises a pair of torsion beams, each of the torsion beams having a length and wherein the torsion beams are non-parallel along a portion of their lengths.

A5

45. (Amended) An apparatus, comprising:

a plurality of actuators, each of the plurality of actuators comprising:

a central stage;

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a movable frame disposed around the central stage;

a first blade coupled to the central stage perpendicular to the surface of the central stage; and

a second blade coupled to the movable frame perpendicular to the surface of the movable frame, the second blade being parallel with the first blade; and

a fixed frame disposed around each movable frame of the plurality of actuators.

A6

48. (Amended) The method of claim 47, further comprising attaching a protective structure to the second side of the substrate prior to etching to release the structures.

A7

65. (Amended) The method of claim 58, wherein the protective lid comprises glass.

A8

67. (Amended) The method of claim 66, further comprising attaching a protective structure to the second side of the SOI substrate prior to etching to release the structures.

A9

76. (Amended) The method of claim 75, further comprising attaching a base substrate to the spacer substrate prior to etching to release the structures.

A10

NEW CLAIMS

84. (New) The apparatus of claim 1, wherein the first blade is electrically isolated from the second blade.

85. (New) The apparatus of claim 8, wherein the flexure is configured to rotate about a single axis and substantially restrict rotation about other axes, the single axis residing along a length of the flexure.

86. (New) The apparatus of claim 1, further comprising:

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a first set of one or more additional blades coupled to the stage, the first set of one or more additional blades electrically connected to each other and to the first blade; and

a second set of one or more additional blades coupled to the stage, the second set of one or more additional blades electrically connected to each other and to the second blade.

87. (New) The apparatus of claim 1, wherein the stage has an additional surface and wherein the apparatus further comprising an electrical trace coupled to the first blade and disposed on the additional surface.

88. (New) The apparatus of claim 8, wherein the stage has an additional surface and wherein the apparatus further comprising an electrical trace coupled to the second blade, the electrical trace disposed on the additional surface and the flexure.

89. (New) The apparatus of claim 85, further comprising a third blade coupled to the frame, the third blade extending perpendicular to the surface of the frame, the third blade being parallel with the first blade.

90. (New) The apparatus of claim 89, wherein the second blade is configured to rotate the stage in one direction and the third blade is configured to rotate the stage in an opposite direction.

91. (New) The apparatus of claim 12, wherein the stage is pivotally coupled to the frame with a flexure.

92. (New) The apparatus of claim 12, further comprising a third blade coupled to the frame, the third blade extending perpendicular to the surface of the frame, the third blade being parallel with the first blade.

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93. (New) The apparatus of claim 91, further comprising isolation segments coupled to electrically separate the first, second and third blades.

94, (New) The apparatus of claim 91, further comprising a third blade coupled to the frame, the third blade extending perpendicular to the surface of the frame, the third blade being parallel with the first blade.

95. (New) The apparatus of claim 94, wherein the second blade is configured to rotate the stage in one direction and the third blade is configured to rotate the stage in an opposite direction.

96. (New) The apparatus of claim 94, wherein the first blade is configured to pass by the second blade when the flexure is rotated in the one direction and wherein the first blade is configured to pass by the third blade when the flexure is rotated in the opposite direction.

97. (New) The method of claim 22, wherein the stage is pivotally coupled to the frame with a flexure and wherein the method further comprises:

rotating the stage to an angle; and

generating a restoring torque with the flexure to balance the torque generated by application of the electrostatic potential.

98. (New) The method of claim 97, wherein the torque is substantially independent of the angle.

99. (New) The method of claim 98, wherein the torque is dependent on the angle.

100. (New) The method of claim 17, further comprising:

applying another electrostatic potential between the first blade and a third blade to move the first blade relative to the third blade in an opposite range of motion.

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101. (New) The method of claim 100, wherein the another electrostatic potential between the first blade and the second blade is applied at a different time than the electrostatic potential between the first blade and the third blade.

102. (New) The method of claim 100, wherein the stage is pivotally coupled to the frame with a flexure and wherein the method further comprises:

rotating the stage about the flexure in a first direction by applying the electrostatic potential between the first blade and the second blade; and

rotating the stage about the flexure in a second direction by applying the another electrostatic potential between the first blade and the third blade.

103. (New) The method of claim 102, wherein rotating the flexure in a second direction comprises generating a restoring force with the flexure to balance the force generated by application of the electrostatic potential.

104 (New) The apparatus of claim 88, wherein the frame has an additional surface having disposed thereon the electrical trace.

105 (New) The apparatus of claim 3, wherein each of the first and second blades has a length and a height, and wherein the range of motion is determined by the length and the height of the first and second blades.

106 (New) The apparatus of claim 30, wherein the support member is constructed from a material of differing expansion than a material of the main body.

107. (New) A method, comprising:

applying a voltage difference between the first blade and the second blade to generate a torque to move the first blade relative the second blade along an angular range of motion;

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forming a gap having a distance between a first blade and a second blade, the first and second blades having opposing surfaces; and

varying the gap between opposing surfaces as a function of the angular range of rotation.

108. (New) The method of claim 107, wherein the adjusting of the torque is maintained approximately constant along the angular range of motion

109. (New) The method of claim 107, wherein the adjusting increases the torque along the angular range of motion.

110. (New) The method of claim 107, wherein the first blade is coupled to a stage and the stage is pivotally coupled to a frame, and wherein applying the voltage difference to generate the torque rotates the stage.

111. (New) The method of claim 107, further comprising reducing the gap along the angular range of motion to increase the torque.

112. (New) The method of claim 107, wherein varying the gap varies the torque.

113. (New) The method of claim 47, wherein etching to release the structures comprises etching through the second trenches.

114. (New) The method of claim 66, wherein etching to release the structures comprises etching through the trenches.

115. (New) The method of claim 75, wherein etching to release the structures comprises etching through the second trenches.

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116. (New) A method for fabricating a microelectromechanical apparatus, comprising the steps of:

forming first trenches on a first side of a substrate;

forming a layer of dielectric material on the first side of the substrate and filling the first trenches with a dielectric material to provide electrical isolation;

patterning a masking layer on a second side of the substrate that is opposite to the first side of the substrate;

forming vias on the first side of the substrate;

metallizing the first side of the substrate;

depositing a second metal layer on the first side of the substrate in order to form a reflective surface;

forming second trenches on the first side of the substrate to define structures;

deeply etching the second side of the substrate to form blades;

attaching a base wafer to the second side of the substrate;

etching through the second trenches to release the structures; and

attaching a protective lid of transparent material to the first side of the substrate.

117. (New) A method for fabricating a microelectromechanical apparatus, comprising the steps of:

patterning a masking layer on a second side of a substrate, wherein the second side of the substrate is opposite to a first side of the substrate;

deeply etching the second side of the substrate to form blades;

fusion bonding a protective base wafer with a recess to the second side of the substrate;

thinning the first side of the substrate;

forming first trenches on the first side of the substrate;

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forming a layer of dielectric material on the first side of the substrate and filling the first trenches with the dielectric material to provide electrical isolation;

forming vias on the first side of the substrate;

metallizing the first side of the substrate;

depositing a second metal layer on the first side of the substrate in order to form a reflective surface;

forming second trenches on the first side of the substrate to define structures;

etching through the second trenches to release the structures; and

attaching a protective lid of transparent material to the first side of the substrate.

118. (New) A method for fabricating a microelectromechanical apparatus, comprising the steps of:

forming a layer of dielectric material on a first side of a silicon-on-insulator (SOI) substrate;

patterning a masking layer on a second side of the SOI substrate that is opposite to the first side of the SOI substrate;

forming vias on the first side of the SOI substrate that extend through a buried oxide layer of the SOI substrate;

metallizing the first side of the SOI substate;

depositing a second metal layer on the first side of the SOI substrate in order to form a reflective surface;

forming trenches on the first side of the SOI substrate to define structures;

etching to the buried oxide layer of the SOI substrate to form blades that reside beneath the respective vias;

attaching a protective structure to the second side of the SOI substrate;

etching through the trenches to release the structures; and

attaching a transparent protective lid to the first side of the SOI substrate.

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119. (New) A method for fabricating a microelectromechanical apparatus, comprising the steps of:

patterning a masking layer on a second side of the substrate that is opposite to a first side of the substrate;

attaching a spacer substrate to the second side of the substrate;

forming first trenches on the first side of the substrate;

forming a layer of dielectric material on the first side of the substrate and filling the first trenches with the dielectric material to provide electrical isolation;

forming vias on the first side of the substrate;

metallizing the first side of the substrate;

depositing a second metal layer on the first side of the substrate in order to form a reflective surface;

forming second trenches on the first side of the substrate to define structures;

etching an opening through the spacer substrate to expose the masking layer on the second side of the substrate;

deeply etching the second side of the substrate to form blades;

etching through the second trenches to release the structures; and

attaching a protective lid to the first side of the substrate.